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January 28, 2002

Ms. Magalie Salas, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

**Re: ET Docket No. 98-153 -- Revision of Part 15 of the Commission's Rules Regarding
Ultra-Wideband Transmission Systems
*Ex Parte Communication***

Dear Ms. Salas:

Pursuant to Section 1.1206(a)(1) of the Commission's Rules, on behalf of XtremeSpectrum, Inc., I am electronically filing this written ex parte communication in the above-referenced proceeding.¹

**PEER-TO-PEER COMMUNICATIONS ARE NECESSARY, AND NEED NOT CREATE
UNWANTED PRECEDENT.**

XtremeSpectrum has proposed two levels of regulation for UWB communications devices: one set of emissions for devices powered by wall current, and hence almost certainly indoors; and a much more stringent set of limits for "peer-to-peer communications" between two battery-operated devices. Peer-to-peer communications may need more stringent limits because they can occur outdoors, without the protection of an exterior building wall between the emitter and certain sensitive outdoor receivers.

Our proposed rule text is attached as an Appendix. The specified emissions levels are lower than those we have shown to be safe for all other spectrum users.

¹ XtremeSpectrum, with 67 employees, conducts research in ultra-wideband communications systems as its sole business. XtremeSpectrum intends to become a ultra-wideband communications manufacturer once the Commission authorizes certification of such systems. XtremeSpectrum takes no position on ultra-wideband radar applications.

We discuss below why peer-to-peer applications are necessary, and why permitting them would not set an unwanted precedent for other proceedings.

A. Peer-to-Peer Communications are Needed for Both Consumer and Non-Consumer Applications, Including Public Safety.

XtremeSpectrum has explained that peer-to-peer operation is essential if a market is to develop for UWB consumer devices.² A ban on peer-to-peer operations would needlessly deny consumers many of the most attractive applications of UWB technology, including such everyday applications as synchronizing a palm-held PDA with a laptop, downloading a digital camera to a laptop or PDA, or even exchanging business card information between PDAs. A distinction between wall-powered and battery-powered devices would be arbitrary and frustrating to consumers, and that in turn would make ultra-wideband less attractive to consumer-device manufacturers. Ironically, because most peer-to-peer activities take place *indoors*, a ban would have a far greater effect on indoor use, where it is not needed, than on outdoor operations.

Non-consumer markets, including public safety, would likewise suffer from a peer-to-peer ban, because it would eliminate the ability to leverage consumer technology. Peer-to-peer capability creates a market for consumer products, when can then support the engineering for high-quality non-consumer products at low cost. By severely impairing the consumer market, a ban on peer-to-peer operation would require public safety and other non-consumer applications to support their own engineering expenses, which are very high. The result would be a sharp increase in the cost of that equipment, if the equipment is available at all.

It is not in the public interest to adopt a rule that needlessly deprives consumers of products they want, and also inhibits the development of important non-consumer devices, with no gain in protection to other spectrum users.

XtremeSpectrum supports strict emissions limits on peer-to-peer communications to protect outdoor receivers. Although this will increase our own costs by millions of dollars, we

² See our filings of January 15, 2002, November 23, 2001, November 14, 2001, and October 22, 2001.

are willing to accept that expense to facilitate the Commission's authorizing peer-to-peer operation.³

B. The Ultra-Wideband Proceeding Need Not Create an Unwanted Precedent for Other Rulemakings.

Some Commission staff members have expressed concern that low emissions limits for peer-to-peer operation may create an unwanted precedent for the rules regulating other types of devices, particularly digital devices and other unintentional radiators. They ask if users in other services -- perhaps GPS or PCS, for example -- might point to the low peer-to-peer UWB emissions as evidence of a Commission finding that *unintentional* Part 15 limits may be too high.

We respectfully suggest that this objection can be overcome, in three respects. First, the Commission has already reached an express determination that UWB emissions are sufficiently different from unintentional Part 15 emissions to require more stringent regulation. Second, the proposal to ban peer-to-peer operations, in order to keep UWB operations indoors, would create just the same kind of precedent as low emissions limits would. And, third, there is no legal objection to drafting a Report and Order that expressly forecloses any precedential effect.

We take up each of these points in turn.

1. The Commission has previously determined that UWB emissions differ enough from unintentional Part 15 emissions to require more stringent regulation.

Early in this proceeding, some commenters proposed that UWB emissions are similar to those from unintentional radiators, and so could be regulated similarly. The Commission emphatically rejected the idea. The NPRM said:

We do not agree with the assessment of some of the comments that characterize the emissions from UWB systems as having the same potential for causing harmful interference as emissions from unintentional radiators. Unintentional radiators are permitted to radiate anywhere within the spectrum at the general emission limits. In most cases, unintentional

³ The "millions of dollars" cost increase is not an exaggeration. The emissions limits we propose for indoor operation can easily be achieved with CMOS microchip technology -- the same technology that powers hundreds of millions of personal computers and inexpensive consumer products. But the lower limits for peer-to-peer operation will require shifting to silicon-germanium chips, which are far more costly to engineer and manufacture.

radiators, as well as most conventional Part 15 transmitters, generate emissions on only a few narrow frequencies that approach the general limits; the other emissions are well below these limits. *However, the emissions from UWB transmission systems are considerably different from those of unintentional radiators and conventional Part 15 transmitters.* The high peak to average ratio of emissions, the extremely narrow pulse widths, and the pulse repetition frequencies employed by UWB devices serve to differentiate UWB products from other Part 15 devices. In particular, the emissions from UWB transmitters could be near the maximum permitted levels over several gigahertz of spectrum.⁴

In short, the imposition of stricter regulation on UWB than on unintentional radiators is entirely consistent with positions the Commission has already taken in this proceeding.⁵

2. *A peer-to-peer ban intended to keep UWB operations indoors would create the same precedent as would low emissions limits.*

Our understanding of the staff's motivation in considering a ban on peer-to-peer communications is to restrict UWB devices to indoor operation, in order to reduce the signal level reaching outdoor receivers. In terms of setting precedent, however, this measure is functionally equivalent to permitting outdoor operation, but at lower levels. Both approaches reduce UWB outdoor emissions to levels below those permitted for unintentional radiators. The Commission cannot rationally reject one of these options while embracing the other.

3. *The Report and Order can be drafted to foreclose any precedential effect.*

The Commission can promulgate a Report and Order that avoids setting unwanted precedents by establishing the points listed below. The grounds for each are amply supported by the record.

⁴ *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, 15 FCC Rcd 12086 at para. 40 (2000) ("NPRM").

⁵ XtremeSpectrum has argued elsewhere that ultra-wideband emissions are similar enough to digital device noise that we can look to long experience with digital devices for added assurance that UWB will not cause harmful interference. But XtremeSpectrum has also said it will agree to UWB limits well below Part 15 levels in sensitive bands, in part to allow for the differences the Commission perceives between some UWB signals and digital noise. *See, e.g.*, our ex parte filing of January 3, 2002.

- This has been an unusually controversial proceeding, involving a wide variety of UWB advocates and opponents.
- Despite a vigorous debate on the record, the parties have been unable to agree on emissions levels needed to adequately protect certain Government-operated systems and safety-of-life and commercial services, including GPS and PCS.
- Faced with conflicting views, the Commission has made a deliberate effort to err, if at all, on the side of caution.
- The emissions limits adopted in this proceeding do not represent the Commission's final thinking, but rather are a deliberate compromise that allows UWB to go forward while ensuring the protection of other services.
- Unless eventually justified by experience, the limits and other conditions adopted here are unique to this proceeding.
- For all of these reasons, the Commission will not be receptive to requests for changes to other rules, based on what we have done here.

In short, the Commission can adopt UWB rules under the present set of circumstances, and decline to extend them to different circumstances. That is fully consistent with the principle of adherence to precedent and the Administrative Procedure Act, and common sense as well.

The Commission has always supported technological innovation, regulatory flexibility, and efficient use of limited spectrum resources. Departing from these principles now would establish another kind of unwanted precedent, one likely to discourage innovation and investment in the future.

CONCLUSION

Peer-to-peer communications are necessary to meet the needs of consumers and non-consumers alike. The Commission can authorize peer-to-peer communications at emissions levels low enough to fully protect other spectrum users, without setting an unwanted precedent for other proceedings.

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If there are questions about this submission, please call me at the number above.

Respectfully submitted,

Mitchell Lazarus
Counsel for XtremeSpectrum, Inc.

cc: Chairman Michael Powell
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APPENDIX -- Proposed Rule Text

15. ____ Protection of other services.

(a) An ultra-wideband communications device may not be mounted on an outdoor surface or support.

(b)(i) Under no circumstances may the emissions from an ultra-wideband communications device exceed these limits:

Frequency (MHz)	Field strength (microvolts/meter)	<i>[NOTE IN DRAFT]</i>
960-1574.92	125	<i>[Class B - 12 dB]</i>
1574.92-1575.92	45	<i>[Class B - 21 dB]</i>
1575.92-1990	125	<i>[Class B - 12 dB]</i>
above 1990	500	<i>[Class B]</i>

(ii) In the table above, the measurement distance is 3 meters. The tighter limit applies at band edges. Measurements shall be performed using a resolution bandwidth of 1 MHz.

(iii) In addition to the provisions of paragraph (b)(i), emissions limits in the band 1574.92-1575.92 MHz measured using a resolution bandwidth of 10 kHz shall not exceed 15 microvolts/meter measured at 3 meters. *[NOTE IN DRAFT: This represents a 10 dB additional attenuation for spectral lines in the GPS band.]*

(c) The provisions of this subsection apply to a battery-powered ultra-wideband device in communication with another battery-powered ultra-wideband device.

(i) The following emissions limits apply in lieu of those set out in section (b):

Frequency (MHz)	Field strength (microvolts/meter)	<i>[NOTE IN DRAFT]</i>
960-1610	10	<i>[Class B - 34 dB]</i>
1610-3100	80	<i>[Class B - 16 dB]</i>
3100-4200	160	<i>[Class B - 10 dB]</i>
above 4200	500	<i>[Class B]</i>

(ii) A battery-powered ultra-wideband device must be designed so that it cannot commence communicating with another battery-powered ultra-wideband device unless the user affirmatively initiates the transmission, as by pressing a button.

(iii) As an alternative to compliance with paragraphs (i) and (ii), a battery-powered ultra-wideband device can be made incapable of communicating with another battery-powered ultra-wideband device outdoors.

[NOTE IN DRAFT: The last provision allows "full power" peer-to-peer operation where the device can establish it is indoors -- e.g., by detecting a nearby AC-powered unit.]